

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
CASEY PRINDIVILLE

Serial No.: 10/799,468

Filed: March 11, 2004

For: APPARATUS AND METHODS FOR
COVERLAY REMOVAL AND
ADHESIVE APPLICATION

Confirmation No.: 7702

Examiner: Sing P. Chan

Group Art Unit: 1734

Att'y Docket: 2008.011796
(formerly 6047-68004-01)

Customer No.: 23720

APPEAL BRIEF

Mail Stop Appeal Brief
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby submit this Appeal Brief to the Board of Patent Appeals and Interferences in response to the Final Office Action dated November 21, 2005. The Notice of Appeal was filed on March 21, 2006.

The Director is authorized to deduct the fee for filing this Appeal Brief (\$500), or any additional fees under 37 C.F.R. §§ 1.16 to 1.21 required for any reason relating to this document, from Williams, Morgan & Amerson, P.C. Deposit Account No. 50-0786/2008.011796.

I. REAL PARTY IN INTEREST

The present application is owned by Micron Technology, Inc.

II. RELATED APPEALS AND INTERFERENCES

Applicants are not aware of any related appeals and/or interferences that might affect the outcome of this proceeding.

III. STATUS OF THE CLAIMS

Claims 21-36 are pending in the application. Claims 21-36 are at issue in this appeal and they are attached as Appendix A. Claims 21-36 were rejected in the Final Office Action issued on November 21, 2005. Claims 21-36 are the subject of the present appeal.

IV. STATUS OF AMENDMENTS

No amendments have been filed subsequent to the Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In general, in one very broad aspect, the present invention is directed to an apparatus used in semiconductor manufacturing for cutting a section of adhesive material and attaching the cut adhesive tape strip to a support element. There is one independent claim at issue in the current appeal: claim 21.

Among other things, the apparatus defined by claim 21 includes a support-element-feeder portion situated and configured to provide a support element, an adhesive-film-attachment portion comprising a displaceable block, a cutting blade situated relative to the block, an adhesive-film-drive mechanism situated and configured to advance the length of adhesive film to the adhesive-film-attachment portion to place a desired portion of the adhesive film on the block, and a coverlay-removal mechanism coupled to the adhesive-film-drive mechanism and configured to remove the coverlay portion from the desired portion of the adhesive film in synchrony with the adhesive-film-drive mechanism placing the desired portion of the adhesive film on the block, wherein displacement of the block a first distance causes the cutting blade to cut the adhesive-film strip from the length of adhesive film, and displacement of the block a second distance applies the cut adhesive-film strip to the support element provided by the

support-element-feeder portion. By way of example only, at least portions of the invention are described at p. 7, l. 9 – p. 9, l. 11; p. 11, l. 15 – p. 13, l. 14; Figure 3.

Dependent claims 22 and 23 further limit claim 21 by reciting a structure that enables the adhesive-film strip to be attached to the support element such that the adhesive-film strip covers from about 70% to about 98% of a wire-bond slot. By way of example only, at least portions of the invention are described at p. 13, l. 7 – p. 14, l. 29.

Dependent claim 35 further limits claim 21 by reciting that the adhesive-film-attachment portion further comprises a piston operably coupled to the block so as to displace the block the recited first and second distances. By way of example only, at least portions of the invention are described at p. 10, ll. 1-22; Figure 3.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 21-31 and 35-36 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sakumoto (U.S. Patent No. 4,933,219) in view of Saito (U.S. Patent No. 6,080,263), VanNortwick (U.S. Patent No. 6,025,212) and Tsukagoshi (JP 11-123471).

2. Claims 32-34 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sakumoto in view of Saito, VanNortwick and Tsukagoshi and further in view of Wroblewski (U.S. Patent No. 3,788,572).

VII. ARGUMENT

A. Legal Standards

As the Board well knows, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify

the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); M.P.E.P. § 2142. Moreover, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); M.P.E.P. § 2143.03.

With respect to alleged obviousness, there must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561 (Fed. Cir. 1986). In fact, the absence of a suggestion to combine is dispositive in an obviousness determination. *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573 (Fed. Cir. 1997). The mere fact that the prior art can be combined or modified does not make the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. The consistent criterion for determining obviousness is whether the prior art would have suggested to one of ordinary skill in the art that the process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894 (Fed. Cir. 1988); M.P.E.P. § 2142.

A recent Federal Circuit case makes it crystal clear that, in an obviousness situation, the prior art must disclose each and every element of the claimed invention, and that any motivation to combine or modify the prior art must be based upon a suggestion in the prior art. *In re Lee*, 61 U.S.P.Q.2d 143 (Fed. Cir. 2002). Conclusory statements regarding common knowledge and common sense are insufficient to support a finding of obviousness. *Id.* at 1434-35. “Our case law makes clear that the best defense against the subtle but powerful attraction of hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.” *Teleflex v. KSR Intern. Co.*, 119 Fed. Appx. 282 (Fed. Cir. 2005) (unpublished) (citations omitted).

B. The Examiner’s Rejections Should Be Reversed

As discussed more fully below, it is respectfully submitted that the Examiner’s § 103 rejections are improper for many reasons. Before addressing the details of the rejections, it is worth stating that the Examiner has engaged in an improper use of hindsight using Applicant’s disclosure as a roadmap. More specifically, it appears that the Examiner, after reviewing the present application, merely attempted to pick and choose various aspects of the claimed inventions from several prior art references in an attempt to find all aspects of the claimed invention. In doing so, the Examiner erred by failing to identify any motivation or suggestion to combine the art in the manner suggested by the Examiner. Simply put, the Examiner identified various features from many different pieces of prior art and magically concluded that the claimed invention would have been obvious. In doing so, the Examiner, with all due respect, erred.

1. Claim 21 is Allowable

Claim 21 stands rejected based upon the combination of four references – Sakumoto, Saito, VanNortwick and Tsukagoshi. As the Board well knows, it is the entirety of the claimed

invention that must be considered in any obviousness inquiry – not simply an identification of various pieces of prior art where some or all of the various features of the claimed invention may be found. Applying the proper analysis under § 103, it is respectfully submitted that the Examiner erred in rejecting claim 21.

Claim 21 is directed to an apparatus for attaching an adhesive-film strip to a support element. The adhesive-film strip is cut from a length of adhesive film that comprises an adhesive portion and a coverlay portion adhering to the adhesive portion. The apparatus comprises the following combination of features: (1) a support-element-feeder portion situated and configured to provide a support element; (2) an adhesive-film-attachment portion comprising a displaceable block; (3) a cutting blade situated relative to the block; (4) an adhesive-film-drive mechanism situated and configured to advance the length of adhesive film to the adhesive-film-attachment portion to place a desired portion of the adhesive film on the block; (5) a coverlay-removal mechanism coupled to the adhesive-film-drive mechanism and configured to remove the coverlay portion from the desired portion of the adhesive film in synchrony with the adhesive-film-drive mechanism placing the desired portion of the adhesive film on the block; and (6) displacement of the block a first distance causes the cutting blade to cut the adhesive-film strip from the length of adhesive film, and displacement of the block a second distance applies the cut adhesive-film strip to the support element provided by the support-element-feeder portion.

Sakumoto, the Examiner's primary reference, discloses removing a release film from the adhesive portion of an adhesive tape, cutting or punching the adhesive portion to produce a piece having a definite length, and bringing the piece of adhesive portion into contact with a lead frame. Then, an IC chip is placed on the adhesive portion, and the resulting assembly is heated

to cure the adhesive. Col. 4, ll. 13-24. The Examiner concedes that Sakumoto does not provide any information as to an apparatus for performing these steps or of how an apparatus might be configured to perform these steps. Final Office Action, p. 2. Despite this admitted deficiency, the Examiner states, in conclusory fashion, that “one of ordinary skill in the art reading Sakumoto et al would appreciate providing any combination of means to perform these steps” (emphasis added). Final Office Action, p. 2. Such a baseless conclusion is simply improper. In fact, the Examiner’s contention that Sakumoto, which provides no information whatsoever concerning any apparatus, provides a person (skilled or not) with any combination of means for doing anything lacks any reasonable support.

In an effort to cure the admitted deficiencies in Sakumoto, the Examiner relies, in part, on the disclosure of Saito. Saito is directed to a machine for applying a sheet of protective film across the entirety of a surface of a wafer and thereafter cutting the protective film. The machine in Saito is fundamentally different than the one described by claim 21 – a machine that is adapted to first cut the adhesive film strip from a roll of material, and thereafter apply the cut piece of adhesive-film strip to a support member. Saito addresses concerns that are similar to concerns that would be faced by someone attempting to apply a sheet of sticky Saran Wrap smoothly (without wrinkles or entrapped air bubbles) to a large, flat surface. According to Saito, the machine disclosed therein is used to apply a back-tension (tensile force) to the film as the film is being applied to the wafer (but without warping the wafer) and to eliminate residual cut remnants of the film by using a particular method of cutting the film around the circumference of the wafer after the film has been applied to the wafer.

Saito also fails to teach or suggest anything concerning an adhesive-film-attachment portion comprising a displaceable block. The Examiner concedes that Saito fails to teach or

suggest anything concerning a cutting blade situated relative to the block. Final Office Action, p. 4. In this regard, Saito also necessarily fails to teach or suggest placing anything regarding a displaceable block. Saito also fails to teach or suggest anything concerning displacing a block a first distance to cut an adhesive-film strip from a length of adhesive film and displacing the block a second distance to apply the cut adhesive-film strip to the support element.

Another secondary reference used by the Examiner is VanNortwick. VanNortwick is directed to a machine and method for applying double sided tape decals to a lead frame for a lead on chip (LOC) semiconductor package. Abstract; Col. 2, ll. 21-34. To that end, VanNortwick discloses a tape cutting apparatus comprises of two reels 44 that supply continuous lengths of double sided tape 54 that is to be cut to form the decals 74. Col. 3, ll. 51-61. A width of the tape 54 is the same as the width of the cut decals 74. Col. 4, ll. 16-17. This width is referenced as the “x” dimension in Figure 5. Col. 5, ll. 26-54; Figure 5. The machine disclosed in VanNortwick is used to cut the tape 54 into desired lengths “y” which are determined by the indexing and cutting steps of the machine disclosed therein.

The Examiner concedes that the combination of Sakumoto, Saito and VanNortwick still fails to disclose all elements of the invention set forth in claim 21 – the combination fails to disclose that the cutting blade is situated relative to the cutting block as recited in claim 21. Final Office Action, p. 4. Undeterred, the Examiner again states, in conclusory fashion, that one skilled in the art would be motivated to add the punch and die in Tsukagoshi to the previous collection of three prior art references.

Applicants respectfully submit that, in rejecting claim 21, the Examiner has heaped conjecture on top of supposition to somehow conclude that one skilled in the art would have been motivated to combine the four references identified by the Examiner.

First, it appears that the “closest” reference might be Saito, as it shows removing a release liner 111 from the film 109. In Saito, it is undisputed that the film 109 is applied to the wafer before it is cut. Claim 21 requires, among other things, that the adhesive film strip is cut before it is applied to the support element – the exact reverse of what happens in Saito. In making the rejection, the Examiner appears to suggest that the machine in Saito could be modified such that the film 109 could be cut before it is applied to the wafer. It is not clear to the undersigned that the machine in Saito would work for its intended purpose if it were modified in an attempt to accomplish this purpose – cut the film 109 before it is applied to the wafer. Such a modification would appear to be contrary to the express disclosure of Saito. It is unclear why one skilled in the art would be motivated to modify Saito in this manner.

If VanNortwick is considered as the starting reference, it is unclear why one skilled in the art would view VanNortwick and be motivated to include a means for separating a coverlay from an adhesive material. VanNortwick is directed to a unique method of applying double sided tape. There is no suggestion or disclosure in VanNortwick or any other art of record for employing an adhesive film/coverlay material in the device disclosed in VanNortwick. Again, given the express disclosure of VanNortwick, it is not clear that the device disclosed therein would even work for its intended purpose if a coverlay or release liner were added to the double sided tape disclosed therein.

As stated above, the Examiner did not, and cannot, identify any legitimate motivation for one skilled in the art to combine the references in the manner suggested by the Examiner. The Examiner’s conclusory statements that the invention would have been obvious cannot provide a legitimate basis for an obviousness rejection.

In view of the foregoing, it is respectfully submitted that the Examiner erred in rejecting independent claim 21.

2. Claims 22-23 are Allowable

Dependent claims 22 and 23 further limit claim 21 by requiring that the cut adhesive film strip cover from about 70% to about 90% of a wire bond slot. The Examiner's rejection of these claims is, respectfully, completely without merit.

By way of background, as set forth in the present application, one purpose for covering the wire bond slot is to prevent or reduce the flow of encapsulating material through such an opening during the chip encapsulation process. See, *e.g.*, Specification at p. 3, ll. 1-11, p. 13, l. 15 – p. 14, l. 23. In rejecting claims 22-23, the Examiner specifically relies on the disclosure of VanNortwick. Final Office Action, p. 4.

VanNortwick does disclose a lead frame that contains openings to allow conductive connections between the lead finger 28 and the bond pads 10 on the die via conductive bond wires. Col. 3, ll. 28-33; Col. 5, ll. 26-44; Figures 1 and 5. VanNortwick specifically notes that the decals 74 are “generally parallel to one another and spaced apart by a distance sufficient to provide access to the bond pads 16 on the die 10.” Col. 5, ll. 41-44 (emphasis added). Thus, the cut adhesive strips in VanNortwick are not positioned to cover any opening – in fact, they are specifically positioned so as to allow access to the bond pads 16 on the die 10. In short, there is nothing in VanNortwick to suggest placing a cut adhesive strip such that it covers about 70-100% of a wire bond slot. If anything, VanNortwick teaches away from such an invention.

As discussed above, Saito is directed to a machine that places a film 109 across the entirety of a wafer surface. Saito certainly does not discuss or contemplate placing a film over a portion of any opening of any kind.

For at least the aforementioned reasons, it is respectfully submitted that the Examiner erred in rejecting dependent claims 22 and 23.

3. Claim 35 is Allowable

Dependent claim 35 further limits claim 21 by reciting that a piston is operably coupled to displace the block the recited first and second distances. The Examiner concedes the art does not teach this additional limitation. Final Office Action, pp. 7-8. Nevertheless, the Examiner magically concludes that such a structure would have been obvious. Clearly, such unsupported conclusory statements cannot support a § 103 rejection. Suffice it to say, even the collection of art assembled by the Examiner to make the § 103 rejection of claim 35 does not suggest or disclose a piston that is adapted to move a displaceable block between the first and second distances specifically recited in claim 35.

For at least the aforementioned reasons, it is respectfully submitted that the Examiner erred in rejecting claim 35.

VIII. CLAIMS APPENDIX

The claims that are the subject of the present appeal – claims 21-36 – are set forth in the attached “Claims Appendix.”

IX. EVIDENCE APPENDIX

Applicant does not rely upon any evidence as indicated on the attached Evidence Appendix.

X. RELATED PROCEEDINGS APPENDIX

There are no Related Proceedings for this appeal as indicated on the attached Related Proceedings Appendix.

XI. CONCLUSION

“Our case law makes clear that the best defense against the subtle but powerful attraction of hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.” *Teleflex v. KSR Intern. Co.*, 119 Fed. Appx. 282 (Fed. Cir. 2005) (unpublished) (citations omitted). In this case, the Examiner, respectfully, failed to follow this guidance. Accordingly, the Examiner’s obviousness rejections should be REVERSED.

The undersigned attorney may be contacted at (713) 934-4055 with respect to any questions, comments or suggestions relating to this appeal.

Respectfully submitted,

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CLAIMS APPENDIX

21. In semiconductor manufacture, an apparatus for attaching an adhesive-film strip, supplied from a length of adhesive film that comprises an adhesive portion and a coverlay portion adhering to the adhesive portion, to a support element, the apparatus comprising:

a support-element-feeder portion situated and configured to provide a support element;

an adhesive-film-attachment portion comprising a displaceable block;

a cutting blade situated relative to the block;

an adhesive-film-drive mechanism situated and configured to advance the length of adhesive film to the adhesive-film-attachment portion to place a desired portion of the adhesive film on the block; and

a coverlay-removal mechanism coupled to the adhesive-film-drive mechanism and configured to remove the coverlay portion from the desired portion of the adhesive film in synchrony with the adhesive-film-drive mechanism placing the desired portion of the adhesive film on the block;

wherein displacement of the block a first distance causes the cutting blade to cut the adhesive-film strip from the length of adhesive film, and displacement of the block a second distance applies the cut adhesive-film strip to the support element provided by the support-element-feeder portion.

22. The apparatus of claim 21, wherein:

the support element defines a wire-bond slot; and

the adhesive-film-attachment portion and the support-element-feeder portion are configured to attach the adhesive-film strip to the support element such that the adhesive-film strip covers from about 70% to about 98% of the wire-bond slot.

23. The apparatus of claim 21, wherein:

the support element defines a wire-bond slot; and

the adhesive-film-attachment portion is configured to cut the adhesive-film strip to a size for covering from about 70% to about 98% of the wire-bond slot.

24. The apparatus of claim 21, further comprising a film guide for guiding the adhesive film into the adhesive-film-attachment portion.

25. The apparatus of claim 21, further comprising an adhesive-film-storage portion for providing the length of adhesive film.

26. The apparatus of claim 25, wherein the adhesive-film-storage portion comprises a reel on which the length of adhesive film is wound.

27. The apparatus of claim 21, wherein:

the adhesive-film-drive mechanism comprises a drive-wheel assembly comprising a first push wheel and a second push wheel;

the length of adhesive film comprises a first side and a second side; and

the first push wheel is in engagement with the first side and the second push wheel is in engagement with the second side as the adhesive film passes through the drive-wheel assembly to the adhesive-film-attachment portion.

28. The apparatus of claim 27, wherein at least one of the first push wheel and the second push wheel is pressed by a spring into engagement with the length of adhesive film.

29. The apparatus of claim 27, wherein the coverlay-removal mechanism separates the coverlay portion from the adhesive portion after the adhesive film passes through the pinch-wheel assembly.

30. The apparatus of claim 29, wherein:
the first side comprises the coverlay portion;
the second side comprises the adhesive portion;
the coverlay-removal mechanism comprises a pinch-wheel assembly comprising a pinch roller engaged with the first push wheel; and
the coverlay portion is removed from the adhesive portion by rotation of the first push wheel and consequent rotation of the pinch roller.

31. The apparatus of claim 30, where the removed coverlay portion is pinched between and is pulled by a friction force established between the rotating first push wheel and pinch roller.

32. The apparatus of claim 30, wherein the coverlay-removal mechanism further comprises an idler assembly comprising an idler roller engaged with the coverlay portion as the coverlay portion is being removed from the adhesive portion and passing to the pinch roller and first push wheel.

33. The apparatus of claim 32, wherein the idler roller exerts a variable pressure on the coverlay portion as the coverlay portion is being removed from the adhesive portion.

34. The apparatus of claim 33, where the idler assembly further comprises a spring situated and configured to press the idler roller into engagement with the coverlay portion.

35. The apparatus of claim 21, wherein the adhesive-film-attachment portion further comprises a piston operably coupled to the block so as to displace the block the first and second distances.

36. The apparatus of claim 21, wherein the block defines a vacuum passage situated and configured to hold the desired portion of the adhesive film on the block by vacuum pressure.

EVIDENCE APPENDIX

Applicants do not rely on any evidence for this appeal.

RELATED PROCEEDINGS APPENDIX

There are no Related Proceedings for this appeal